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DEPARTMENT OF AGRICULTURE.

SPECIAL REPORT—No. 1.

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STATEMENT

SHOWING THE

CONDITION AND PROSPECTS

OF THE

CANE-SUGAR INDUSTRY

IN

THE UNITED STATES.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.

1877.





## THE CANE-SUGAR INDUSTRY.

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Soon after induction into his present office, the attention of the Commissioner was directed to the condition of the sugar interest in the United States.

The facts elicited in this examination are thought to be of sufficient importance to warrant publication at this time, with the hope of awakening an interest in the subject commensurate with its great value to the whole country.

In view of the fact that the sugar-lands of Louisiana are unsurpassed in natural fertility and productiveness, and that in years preceding the war of the rebellion they furnished the country a very much larger proportion of its saccharine supply than since the conclusion of the strife, there is no satisfactory reason why the United States should continue to pay annually millions of dollars to foreign nations for articles of consumption that might readily be supplied by domestic producers. The production of sugar in Louisiana having fallen off immensely,\* it was deemed advisable to obtain the views of planters upon the general subject, but more especially in relation to the particular causes of decline in the culture, and the best methods and appliances through the employment of which the industry might be restored, and, if practicable, still further advanced. The following letter was therefore addressed to leading planters of Louisiana:

DEPARTMENT OF AGRICULTURE,  
*Washington, July 28, 1877.*

DEAR SIR: It is earnestly desired, so far as it is possible, by the aid of the department, to give encouragement to an increase in the production of sugar, that we may save the millions of dollars that annually go elsewhere for importations. We have a soil and climate adapted to the growth of cane inferior to none, and should, in fact, if proper attention were given to this industry, supply the markets of the world with sugar.

Will you give your attention and valuable experience to this subject and advise me how this department can best promote this interest?

Very respectfully,

WM. G. LE DUC,  
*Commissioner.*

The large number of replies received to this letter and the warm interest manifested in the subject by the writers give much satisfaction to the Department, and it is believed that substantial good will follow from the stimulation of special inquiry among the planters themselves.

In this correspondence, as it relates to the decreased production of sugar in Louisiana and the possibilities of the reinvigoration of the industry, the ground is very fairly, if not thoroughly, traversed. The causes of lessened production are clearly stated, and the remedies, to some extent, foreshadowed. The writers being for the most part land proprietors and planters, some of them of large

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\*Bouchereau institutes a comparison between the crop of 1861-'62 and that of 1876-'77, which shows the former to have been 459,410 hogsheads, or 528,321,500 pounds of sugar, and the latter 169,331 hogsheads, or 190,672,570 pounds.

experience, their statements and suggestions may be considered reliable and entitled to respectful consideration, to the extent that these relate to an industry with which they must be supposed thoroughly and accurately familiar.

CONSUMPTION OF SUGAR IN THE UNITED STATES.

The following tables were compiled by the New York Shipping List from governmental and commercial reports, by adding to the imports of each year the amount left over from the previous year and deducting the surplus at the close. To this is added a reliable estimate of the amount of domestic sugar and molasses produced within the year, deducting the quantities exported. This process gives a close approximation to the actual consumption. These figures are republished, with indorsement, by Mr. L. Bouchereau, in his excellent reports on sugar production in Louisiana. The importation of sugar and molasses on the Pacific coast is not given by the above authority, and cannot be made out from the Treasury reports in calendar years, for the reason that these reports conform only to fiscal years. Local statisticians at San Francisco give the importations for three years, omitting fractions, as follows: 1874, 3 2,425 tons; 1875, 22,850 tons; 1876, 30,882 tons.

*Consumption of sugar in the United States.*

Years.	Total consumption.	Imported.	Domestic.
	<i>Tons of 2,240 lbs.</i>	<i>Tons of 2,240 lbs.</i>	<i>Tons of 2,240 lbs.</i>
1860.....	415,281	296,250	119,031
1861.....	303,819	241,420	122,399
1862.....	432,411	241,411	191,000
1863.....	284,308	231,398	52,910
1864.....	220,660	192,660	28,000
1865.....	350,809	345,809	5,000
1866.....	391,678	383,178	8,500
1867.....	400,568	378,068	22,500
1868.....	499,533	446,533	23,000
1869.....	492,899	447,899	45,000
1870.....	530,692	483,892	46,800
1871.....	633,314	553,714	79,600
1872.....	637,373	567,573	69,800
1873.....	652,025	592,725	59,300
1874.....	710,369	661,869	48,500
1875.....	685,352	621,852	63,500
1876.....	638,369	• 561,369	77,000

The importations of cane molasses, in the same years, are shown as follows :

Years.	Total consumption.	Imported.	Domestic.
	<i>Gallons</i>	<i>Gallons.</i>	<i>Gallons.</i>
1860.....	47,318,877	28,724,205	18,594,672
1861.....	40,191,556	20,383,556	19,808,000
1862.....	62,668,400	25,650,400	37,018,000
1863.....	37,569,088	26,569,088	11,000,000
1864.....	32,410,325	28,582,325	3,828,000
1865.....	35,185,038	34,335,038	850,000
1866.....	45,140,110	43,840,110	1,300,000
1867.....	49,776,465	46,776,465	3,000,000
1868.....	55,957,969	52,587,969	3,370,000
1869.....	54,361,092	47,661,092	6,400,000
1870.....	49,323,171	42,723,171	6,600,000
1871.....	52,065,784	41,165,784	10,900,000
1872.....	53,695,203	42,995,203	10,700,000
1873.....	51,485,526	41,985,526	9,500,000
1874.....	48,206,257	39,506,257	8,700,000
1875.....	58,608,734	46,418,734	12,190,000
1876.....	46,809,504	36,456,504	12,350,000

From which tables it appears that, in the years named, the United States produced less than 13 per cent. of the cane-sugar it consumed, and little more than 21 per cent. of its molasses consumed.

The leading sources of our foreign supply are exhibited below. Twenty-one other nations supply the remainder, which is about 3 per cent. of the whole amount:

Countries.	Quantity.	Value.
	<i>Pounds.</i>	
Cuba .....	1,003,413,671	\$41,039,048
Spanish possessions .....	110,445,708	3,572,400
Porto Rico .....	70,155,045	2,610,418
French West Indies and Guiana .....	49,687,265	1,751,478
Brazil .....	40,010,416	1,320,938
Dutch East Indies .....	26,187,830	1,052,953
British West Indies and Honduras .....	23,212,168	844,144
British Guiana .....	21,865,691	912,101
Sandwich Islands .....	20,978,374	1,051,987

*Consumption per capita.*—As the foregoing tables do not include the Pacific States, their population is deducted in obtaining the consumption *per capita*. The increase of population in the States east of the Rocky Mountains, during the ten years from 1860 to 1870, was at the rate of 21 per cent. for the whole decade, or over 2 per cent. per annum compounded.

Equalizing this increase, and allowing for the destructive influence of the years of warfare, the following rates of consumption *per capita* are arrived at, viz: 1860, 29.58 pounds; 1861, 26.14; 1862, 30.73; 1863, 20.05; 1864, 15.37; 1865, 24.08; 1866, 26.35; 1867, 26.17; 1868, 29.78; 1869, 30.35; 1870, 31.76.

The average increase of population per decade prior to the war was between 33 and 35 per cent., which would give nearly 3 per cent. per annum compounded. During the earlier years of the current decade, this rate was fully kept up by a very large foreign immigration. An increase of 3 per cent. is allowed for each year up to 1874, and 2½ per cent. for 1875 and 1876. This reduction is allowed on the ground of the falling off in foreign immigration. With the resulting figures of population as divisors, the estimates *per capita* of the current decade are as follows, viz: 1871, 36.80 pounds; 1872, 35.96; 1873, 35.71; 1874, 37.54; 1875, 35.39; 1876, 32.

With various fluctuations, the above figures show a steady increase in the consumption *per capita* up to 1874, the year in which our present commercial stringency was inaugurated. Each of the two subsequent years shows a marked reduction in the consumption, resulting from the decreased purchasing-power of the people.

The marked decline in consumption *per capita* during the late civil war is due, first, to the destruction of home production. Prior to the occupation of Louisiana by the Union armies, sugar-planters made great efforts to supply the Southern States, but the operations of war gradually restricted and the emancipation of the slaves finally prostrated this home production. Secondly, the blockade of Southern ports cut off the Southern people from the foreign market and prevented the import of supplies. Consumption was measurably

restricted to the loyal States, but as the Union armies advanced a wider scope of trade was given and the aggregate imports enlarged. The close of the war showed a sharp advance from 15.37 pounds *per capita* in 1864 to 24.08 pounds in 1865.

The annual production of sugar and molasses in Louisiana from 1868 to 1876 is shown in the following exhibit. In the former year the industry began to recover from the prostrating effects of the civil war :

Year.	Pounds of sugar produced.			Molasses produced.	
	Brown sugar by old process.	Refined and clarified by vacuum-pans.	Total.	Total gallons.	Gallons per each hoghead of sugar.
1868 .....	81,506,093	13,545,132	95,051,225	6,081,907	72
1869 .....	99,452,946	16,845,489	116,298,435	5,724,216	65
1870 .....	147,562,588	21,346,004	168,878,592	10,281,419	71
1871 .....	126,649,952	20,256,173	146,906,125	10,019,958	78
1872 .....	108,501,004	16,845,489	125,346,493	8,893,640	82
1873 .....	88,058,278	15,182,841	103,241,119	8,203,944	92
1874 .....	110,856,363	23,648,328	134,504,691	11,516,828	98
1875 .....	131,700,360	31,717,710	163,418,070	10,870,546	75
1876 .....	149,904,430	40,768,140	190,672,570	12,024,108	71

Referring now to the reports of the United States Bureau of Statistics, and confining attention to the last three years, we are enabled to present the custom-house exhibits of importations, together with the values thereof.

## FISCAL YEAR OF 1874.

Sugar, brown .....	pounds..	1,594,306,354	\$77,459,908
Sugar, refined .....	do ..	39,259	3,139
Molasses .....	gallons..	47,189,837	10,947,824
Melada, sirup, &c. ....	pounds..	106,952,236	4,424,356
Candy, &c .....	do ..	56,443	13,916
Total .....			92,849,203

## FISCAL YEAR OF 1875.

Sugar, brown .....	pounds..	1,695,726,353	\$70,015,757
Sugar, refined .....	do ..	15,251	1,202
Molasses .....	gallons..	49,112,255	11,685,224
Melada, &c .....	pounds..	101,768,386	3,313,597
Candy, &c .....	do ..	76,816	16,737
Total .....			85,033,517

## FISCAL YEAR OF 1876

Sugar, brown .....	pounds..	1,414,254,663	\$55,702,903
Sugar, refined .....	do ..	19,931	1,685
Molasses .....	gallons..	39,026,200	8,157,470
Melada, &c .....	pounds..	79,702,478	2,415,995
Candy, &c .....	do ..	87,995	18,500
Total .....			66,296,553

From which the fact is derived that the average annual value of imported sugar and molasses for the last three years is \$81,393,091.

The large reduction in consumption in 1876, as compared with the three years immediately preceding, is attributable to the economy practiced by the

masses on account of the stringency of the times, and the fact that there was an estimated falling off of about 200,000 tons in the sugar-producing countries from the crop of the preceding year, which caused an average advance of about half a cent per pound in the selling price.

The totals above presented do not, of course, represent the sums that have actually passed into foreign hands for our foreign supply, since, say, two-thirds is returned to the Treasury of the United States as duties.\* Nevertheless, even at the present prices of cane-products, the amount that is so exchanged is enormous, and challenges the earnest and immediate attention of those who are anxious to promote our own industries. In view of the demonstrable fact that the capacity of the sugar-belt of the United States is sufficient not only fully to supply domestic needs, but also under proper stimulants to create a trade of export, it would seem gross unwisdom, if not, indeed, criminal neglect, to omit effort in the direction of fostering an interest of so great financial and economic importance. It is, moreover, a plain proposition that to profitably increase the production of one necessary commodity is to divert labor from the overproduction of another, thus adding to the general prosperity. Thus, we find through our correspondents that in most parts of the South the corn and rice fields, and even some of the cotton-areas, are not so remunerative as formerly. Diversity of crops is the requirement, both on account of the soil and the profitable employment of capital and labor. There is no fault found by sugar-planters with the prices received for their products. The profits are indeed extraordinary, even with the scarcity of labor and the unmethodical and crude methods of cultivation and cane manipulation taken into consideration. The immense loss entailed by the unscientific handling of the *bagasse* is referred to in another part of this article. A large planter in Jefferson Parish, whose letter appears in the appendix, demonstrates that on his crop of the present season a profit of from 80 to 100 per cent. is reasonably to be expected on his outlay.

The importation of sugar and molasses is a necessity only because a sufficient supply is not raised at home, and is not, therefore, to be regarded as a trade directly competing with our own product.

#### THE SUGAR-LANDS.

The authorities describe the sugar-growing region of Louisiana as lying on both sides of the Mississippi River, from about sixty miles below New Orleans to about two hundred miles above, including the lands about many of the bayous, the banks of the Red River, embracing the parishes of Avoyelles and Rapides, and the level lands of Vermillion and Saint Martin; and yet, as was stated in the report of this department for 1873, after an investigation of the subject by its statistician, the average area annually cultivated in sugar-cane in

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\* The report of the Bureau of Statistics for 1876 gives the amount of duties on importation of sugar, molasses, &c., at \$42,000,000, in round numbers.

A New York commercial authority, referring to the magnitude of the sugar trade, expresses the opinion that the value of the imported raw sugar sold, duty paid, in the United States the present year, will perhaps exceed \$125,000,000, to which amount must be added the additional cost of refining, about \$2,000,000. To this must also be added the value of molasses imported, from \$50,000,000 to \$60,000,000.

Louisiana did not exceed 150,000 acres, or about half of an ordinary county.\* It was at the same time asserted that "if even this small acreage could be brought up to the standard which Mr. Bringier, one of the most intelligent planters in Louisiana, thinks is entirely practicable, the annual yield of the State would exceed 885,000,000 pounds of sugar and 52,500,000 gallons of molasses, which would equal one-half our annual import of sugar and exceed our import of molasses."

Nevertheless, the sugar limit is not confined to Louisiana. In ten other States cane, with ordinary cultivation and appliances, has been found to give fair returns, while the reports of yields in the Gulf regions of Texas give promise of great future results. Much of Florida bordering the Gulf coast is indisputably well adapted to profitable sugar-culture. It would be very difficult, if indeed at all practicable, to secure accurate reports of the cane-product outside of Louisiana, in which it is a leading staple carefully noted; but, relying upon the United States censuses for 1860 and 1870, the following is the exhibit of cane-products in the Southern States in the years 1859 and 1869:

States.	1859.		1869.	
	Sugar.	Molasses.	Sugar.	Molasses.
	<i>Hhds.</i>	<i>Galls.</i>	<i>Hhds.</i>	<i>Galls.</i>
North Carolina .....	38	12,494	35	33,888
South Carolina .....	198	.....	1,055	436,882
Georgia .....	1,167	546,749	644	553,192
Florida .....	1,669	436,357	952	344,339
Alabama .....	175	85,115	31	166,009
Mississippi .....	506	10,016	49	152,164
Louisiana .....	221,726	13,439,772	80,706	4,585,150
Texas .....	5,099	408,358	2,020	246,062
Arkansas .....	.....	.....	92	72,003
Missouri .....	402	22,305	49	.....
Tennessee .....	2	2,830	1,410	3,623
Totals .....	230,982	14,963,996	87,043	6,593,323

Referring again to the sugar-lands of Louisiana, several of the correspondents of the Department are very emphatic in expressing the conviction that the area of land adapted to the production of the sugar-cane in that State is sufficient to furnish the United States enough sugar for its whole consumption, if under proper cultivation. Unfortunately, the lands best adapted to the cultivation of sugar-cane are all more or less subject to overflow. While a very inconsiderable portion of the best lands have been put under cultivation, even a large part of these has been rendered unfit for use by the destruction of the levees. In this connection attention is called to the letter of Mr. Longue, of Saint Charles Parish, as a case in point. He relates that on his plantation, before the crevasse of Bonnet-Carré, his crop was ordinarily from 200,000 to 300,000 pounds, and the crops of seven of his neighbors aggregated about 2,600,000 pounds; but that all these lands, as also those of thousands of others, adapted to the cultivation of sugar-cane, remain uncultivated on account of annual inundations. Another planter states that although he owns three sugar-plantations, he is unable, for the same reason, to work them.

\* Bouchereau shows that in the season of 1876-'77 there were 104,944 acres of cane ground, which yielded on an average 1,817 pounds of sugar and 114 gallons of molasses per acre.

Messrs. A. Thompson & Co., sugar-merchants of New Orleans, describe the sugar-area as follows :

Taking the Mississippi River, from the parish of Pointe Coupée down to within a few miles of its mouth, both its banks are lined the whole length with sugar-estates, unequaled for the richness and fertility of the soil, especially the parishes of Ascension, Saint James, Saint John the Baptist, and Saint Charles, and, below the city, the parish of Plaquemines, known before the war as the "Empire Parish," on account of the richness of its productions, and now the great rice and orange growing parish of the State. We have also the lands along the Bayou La Fourche, a rich, black, and exceedingly fertile soil, and showing this year, so far, the largest canes and most promising crops. We must especially report that portion of the country formed of the parishes of Saint Martin and Saint Mary's, along the Bayou Teche, and known as the Attakapas region. Many Northern and Western capitalists, charmed by the beauty of the country, the salubrity of its climate, and the fertility of its soil, have purchased large plantations, and are yearly turning out paying crops, some of them shipping direct to Northern markets. We have also to mention the sugar-producing regions or Red River, composed of the parishes of Rapides and Avoyelles, where the culture is increasing every year, producing a good sugar and a rich, thick molasses, reddish in color, and unequaled for the grocer's trade.

Mr. F. L. Claiborne, of Pointe Coupée Parish, is of the opinion that there is cane-land enough in the State to make one and a half million hogsheads, if the levees are built up; and Mr. Joseph Anger, of Iberville Parish, a planter of forty years' experience, believes that the producing capacity of the State might be increased 300 per cent. by a proper system of levees.

Lands within the sugar-range are cheap and abundant. It is stated by competent authority that sugar-lands, on the navigable rivers and bayous, may be purchased at from \$15 to \$20 per acre, while they have a capacity for the production of 2,000 to 4,000 and even 5,000 pounds of sugar, with a proportionate turnout of molasses.

In the appendix will be found a table, collated from the ninth decennial census of the United States, showing the number of acres improved and unimproved in the sugar-parishes of Louisiana in 1869, which shows that in that year there were 748,539 acres of unimproved land, besides woodlands, in the State.

## THE CROP IN LOUISIANA.

The sugar product of Louisiana annually, since 1823, is tabulated as follows :

Years.	Hogsheads.	Years.	Hogsheads.	Years.	Hogsheads.
1823	30,000	1842	140,000	1859	221,840
1824	32,000	1843	100,000	1860	228,753
1825	30,000	1844	200,000	1861	459,410
1826	45,000	1845	186,000	1863	76,801
1827	71,000	1846	140,000	1864	10,387
1828	88,000	1847	240,000	1865	18,070
1829	48,000	1848	220,000	1866	41,000
1832	70,000	1849	247,923	1867	37,647
1833	75,000	1850	211,201	1868	84,256
1834	100,000	1851	236,547	1869	87,090
1835	30,000	1852	321,934	1870	144,881
1836	70,000	1853	449,324	1871	128,461
1837	65,000	1854	340,635	1872	108,520
1838	70,000	1855	231,427	1873	89,498
1839	115,000	1856	73,296	1874	116,857
1840	87,000	1857	279,697	1875	144,146
1841	90,000	1858	362,296	1876	169,331

Yet the methods employed have been of such a character that there may be said to have been a minimum of production, considering what might have been done with good culture and thoroughly scientific manipulation of the cane. While Louisiana gives 1,200 to 1,800 pounds of sugar to the acre (taking the last three seasons as the standard), the West India product is given at 3,000 to 5,000 pounds, and that of the East Indies often runs up to 7,000. It is stated on authority that in the Mauritius the product was at one time increased from 2,500 pounds to 6,000 and 7,000 pounds. But this was by reason of very careful cultivation and the employment of the best means in the extraction of the saccharine matter. Porter, in his work on the sugar-cane (1843), states, concerning Mauritius, that the average production of sugar to the acre, from cane introduced from Java, was 2,000 pounds. In virgin soil of the best quality more than 5,000 pounds per acre were obtained; but this product was materially lessened the second year, and when the land had been cropped for several years in succession the quantity was frequently reduced to 1,100 or 1,200 pounds.

The matter of lessened yield, or of what is called by planters themselves "deterioration," is one of great moment in considering the question of sugar production. An American authority, writing on this subject before the war, refers to the fact that, "from some cause not well understood, the product of sugar to the acre is not so great as it has been in past years. This may be owing to continued repetition of the same crop without adding manures to the land, or to the practice of reserving inferior canes for seed; while some have supposed it is caused by deterioration of the stock through continued use of cuttings from the same source. To remedy the trouble, in case of this being the cause of deterioration, the United States Government recently [in 1856] collected a new supply of canes from the northern part of South America and distributed them among the planters."\*

In his annual Louisiana sugar report for 1876-'77, Bouchereau states that cane once planted in Louisiana remains in the ground from three to four years, furnishing from two to three successive crops, and that often the old stubbles are rooted up and the same land replanted in cane. Commenting on this management, he says:

A contribution so vital exacted from the soil tends greatly to impoverish it; yet this has long been an error in practice, and, what is worse, has been followed by planting in lands so impoverished the short-jointed and hard, woody stubble. It is this that has caused the present deterioration in cane.

He then cites the fact that unsuitable mineral fertilizers are employed, which, while producing an appearance of fertility, in reality impoverish the land, and still further contribute to the deterioration of the cane. When it is remembered

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\* In 1843 Congress ordered scientific investigations to be made relative to the chemical nature of saccharine substances and the art of manufacturing sugar, under the direction of Prof. A. D. Bache. The investigations were conducted by Prof. R. S. McCulloh, a chemist of reputation, and were thorough in their character, resulting in incalculable practical good to the planters of that day. A series of three reports, covering the chemical examinations, was published at intervals by the Secretary of the Treasury, the last making its appearance in 1847.



that the sugar-crop is one of especial and peculiar exaction, and that under ordinary circumstances even the best soils need rest and replenishment of weakened or exhausted properties, the importance of an intelligent consideration of the best methods of restoring and sustaining our sugar-lands, and of staying the degeneration so generally complained of, will be at once apparent. On this point the observation of Mr. Moore, a planter of Washington Parish, in a letter to the department, are appropriate and suggestive. He says:

It is a well-known fact that, up to the time of the war, the cultivation of all southern agricultural products was yet crude and undefined; but should the new appliances of drainage, deep plowing, fertilizing, and improvement in selection, which have enabled our farmers to quadruple yields per acre of their cotton and other products, be extended to the cultivation of the cane, at present prices of sugar, the value of our increased production would be almost fabulous.

So fully impressed is our correspondent, Mr. Von Phul (whose comprehensive letter is printed in full in the appendix), with the loss entailed by loose methods of cultivation, that he strongly recommends the establishment of an experiment station or farm, in order that the sugar interest may be advanced by proper tests and the solution of a number of perplexing problems in cane-farming. Mr. Von Phul very justly relieves the planter of blame in the matter, giving, undoubtedly, the correct reason, the great risk and expense attending pure experimentation. The letter here referred to affords an accurate picture of primitive methods still adhered to for the lack of thorough instruction in better, and, in the end, very much cheaper.

#### THE BAGASSE. ↓

At the expense of repeating what has already appeared in the published volumes of the Department, the following, from the Annual Report for 1873, condensed from a statement by Mr. M. S. Bringier, is incorporated in this inquiry, in order to show the possible profits that have failed to be realized in prosecuting the sugar industry:

The annual average yield of cane on the sugar-plantations should be about 60,000 pounds per acre, containing 90 per cent., or 54,000 pounds, of juice. The latter, at 80° 5' Baumé, its average strength, contains 15.3 per cent. of pure dry sugar, making the average total amount of saccharine matter in an acre of cane 8,262 pounds, or one pound of sugar to about 7.26 pounds of cane. The sugar, on evaporation, absorbs water of crystallization, raising the percentage of sugar and molasses to 17.59, in the proportion of three parts of sugar to two of molasses. If there were a perfectly exhaustive process by which the whole saccharine element could be extracted, the average yield of an acre of cane would be about 5,700 pounds of sugar and 3,800 pounds of molasses; but the planters require from 35 to 55 pounds of cane to make a pound of sugar and two-thirds of a pound of molasses. The average of the State is 2.25 pounds of sugar and 1 5 pounds of molasses to each 100 pounds of cane. At this rate of production, an average plantation, with 100 acres under cultivation in cane, yields 135,000 pounds of sugar, at 8 cents per pound, and 90,000 pounds of molasses, at 4 cents per pound; total, \$14,400. The expenses of culture are \$5,000; of manufacture, \$5,400; taxes, overseer, engineer, &c., \$2,000; total, \$12,400, leaving a net profit of but \$2,000. Mr. Bringier thinks it demonstrated that 10.5 pounds of cane will easily yield a pound of sugar and two-thirds of a pound of molasses. At this rate 100 acres of cane, averaging 60,000 pounds per acre, should yield 571,428 pounds of sugar, at 8 cents per pound, and 380,952 pounds of molasses, at 4 cents per pound; total, \$60,951.32. The expenses of cultivation and management would be

the same as for the actual crop, but the cost of manufacture would be enhanced, making the total expense \$18,951.32, and leaving a net profit of \$42,000, or \$40,000 more than is now derived from 100 acres of cane on an average.\* These considerations give some idea of the enormous losses inflicted upon the sugar-interest and upon the country by unthrifty methods of production. It is a startling thought that probably a hundred million pounds of sugar are annually burned up in the *bagasse* of imperfectly-treated canes.

Mr. Von Phul refers to several processes, more or less successful, for the amelioration of the difficulty here described. But a change for the better appears to be promised, if the statements of Mr. A. De La Cornilliere, in his lately-published work on the "Culture of Sugar-Cane and Sugar Manufacture in Louisiana," be well founded, and the hopes entertained concerning a new method of handling the *bagasse* do not prove illusive. In referring to a recent invention of Mr. M. S. Bringier for the exhaustion of *bagasse*, he says that the apparatus is simple in execution and easily managed, and makes the *bagasse* yield 40 per cent., or 24 pounds, more juice than is furnished by the passage of the cane through the mill alone. "It is a well-known fact," he says, "that the cane, after several pressures, even as many as eight or ten, still yields juice, and that a complete exhaustion can only be obtained by dissolving the saccharine substances inclosed in the cellular tissues." Commenting on the statements of Mr. De La Cornilliere, the following observations are made by Mr. Bouchereau in his last annual sugar report:

The startling fact, so well attested, that 40 per cent. of the sugar-products of Louisiana, through all her great past, secured in the culture, have been lost through the inadequacy of the machinery employed in manufacture; that nearly one-half of the product has been cast away from countless thousands of fields of cane, extending back through so many years, indeed generations, is certainly calculated to arouse the interest not only of sugar-planters, but of society at large in all its classes and conditions, in the question of sugar-production for the future, not here only, but everywhere.

#### CENTRAL FACTORIES AND SMALL FARMS.

It is evident that if the area of sugar-planting be very widely extended in the adapted regions, including the sugar-belt of Louisiana, Texas, and Florida, there must be a wise innovation upon the old system of large plantations and expensive sugar-houses equipped by individual planters. There is land in great abundance, purchasable at rates very much lower than good farming-lands at the West. It is entirely practicable for these to be worked in small tracts by enterprising farmers, provided the central-factory system, now much talked about at the South, be set on foot. The great expense attending sugar-production, and the especial skill required, reside in the handling of the cane in the sugar-house. If capital erect sugar-factories in the cane districts, the profits of the small producer would accrue from the sale of his raw material. It is simply the carrying by the farmer of his wheat and corn to the miller or the commission merchant. How many small farmers might be expected to flourish at the North and West were it necessary to erect a grist-mill and a distillery on every farm? The system of cultivating small tracts would promote thrift and thorough work, and secure the best attainable results at the South in the cultivation of sugar, as it does at the North in the cultivation of corn

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\* See also letter of Mr. Bringier to the Department, on the same subject, in appendix.

and wheat. Such a division of labor would carry an intelligent and skilled element to the sugar-fields and infuse an energy into the industry hitherto unknown. It is satisfactory to note that the intelligent press of Louisiana is awake to this view of the case, and that attention is being particularly directed to the feasibility of the central-factory system and the great advantages to be derived from its practical operation.

A few planters of Louisiana have already made efforts in the direction of practicing this method, which is found to work well in the French West Indies, and has encouraged many small farmers to raise crops and dispose of them for grinding. Messrs. Walker & Co., to whom allusion has been made before, are decidedly of the opinion that if this system were in vogue a great portion of the uncultivated lands of the State might be farmed out and cultivated in small tracts. They state the single objection that in Louisiana the grinding must be gotten through in the shortest time to avoid frosts, and the country is yet too sparsely populated to furnish enough material for new mills to be worked with success; "however, some of the larger planters are beginning to try the system of buying canes outside of their own crops and grinding them on their mill." But this difficulty, as well as the one of remoteness from fuel, may be overcome. The plan is being discussed of building cheap wooden, horse, or even steam, railways to timber-lands and water-courses from the interior prairie sugar-lands, thence to centrally-located sugar-houses. It is proposed that these roads be built by the united labor and capital of those immediately concerned, affording easy means of transporting both fuel and canes to the mill. "Our prairie-lands," says the Louisiana Sugar Bowl, published in the Attapas region, "are all destined to be cultivated, principally in cane, as soon as railroads are built to supply the fuel, and we are confident that at least *two* lines from New Orleans to Texas will ere long pass over the prairies of Western Louisiana."

Mr. Walker, of Saint Mary's Parish, refers to the fact of such establishments being carried on where canes are purchased. The average price is \$5 per ton of 2,000 pounds, weighed at the factory. In some cases land and seed-cane are furnished by the factory, when \$4 per ton is paid for the canes. He states that the average product of an acre of plant-canes well cultivated, on fair land, is eighteen tons.

As will be seen in the appendix, several correspondents reflect a sentiment in regard to the encouragement of enterprising labor from the North, and a desire to change the "old plantation system," that promise the happiest results. Says Mr. Guion, of Assumption Parish, "We need more labor, and we can readily give employment to thousands of white men at remunerative rates, and whom we expect shall become owners of the soil, since large plantations are being rapidly divided, there being no longer here the ambition to possess large quantities of land that are unproductive." Mr. Moore, of Washington Parish, relates that experience at the South since the war has "thoroughly exploded the old theory that sugar could only successfully and profitably be cultivated by slave labor; also, the erroneous impression that good white labor could not be employed in this climate." And in this view he is very intelli-

gently sustained by Mr. Spangenberg, of Jefferson Parish, to whose letter special attention is called. Mr. Austin, of Saint Mary's Parish, says that some effort has been made to introduce a white element there, and he is of the opinion that ultimately, "when the attention of our intelligent, industrious class of farmers is turned to this country, labor will be procured, and that of the right stamp."

#### SUMMARY.

From the foregoing the following facts are deduced:

1. That the United States is paying annually to other nations immense sums of money for a staple article of consumption which, the proper encouragement and support being afforded, might be produced at home.

2. That the production of sugar in Louisiana, our chief source of domestic supply, was about 63 per cent. less in 1876-'77 than in 1861-'62, while at the same time in the years of largest production a very insignificant part of the whole body of cane-bearing lands have at any time been under cultivation.

3. That the system of sugar-production heretofore followed has not been of a character calculated to produce the best results, great losses having been entailed on account both of the agricultural methods and the mechanical appliances used in extracting the saccharine matter, the loss through unscientific handling of the *bagasse* alone amounting to at least 40 per cent.

4. That an improved system of labor, involving the division and the cultivation of smaller tracts by individual owners, and a more thorough and scientific handling of the cane, would very largely increase the sugar-product and go far toward keeping pace with the annually-increasing demand of the whole country.

5. That successive plantings of the same seed-cane has resulted in a deterioration of the stock that demands serious and immediate attention.

6. That there are immense tracts of unoccupied and abandoned sugar-lands in Louisiana which are purchasable at low rates.

7. That the absorption of these lands by small cultivators depends upon the protection afforded by a good levee system, the establishment of central factories, and the construction of transportation ways.

8. That a very large area, heretofore highly productive, cannot be safely worked on account of inundations arising from the bad condition of levees.

9. That the new system of ownership of small farms, which is now being encouraged, will give growth to individual independence, draw around itself educational and refining influences, and build up and energize new and thriving communities, such as exist wherever self-reliant and intelligent labor flourishes.

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The suggestions and recommendations of sugar-cultivators from whom letters have been received by the department are succinctly given as follows:

1. Protection of the lands from overflow by means of a levee system to be devised and maintained by the General Government.

2. The clearing up and draining of swamp and low lands, and the determi-

nation of outlet drainage, with special reference to encouraging and assisting small planters, the system obtaining in Holland, or a suitable modification of it, being recommended.

3. Labor, white and colored, of which there is scarcity upon the lands even now worked. An element is desired that is willing to work on the tenant system, thrifty, ambitious to own lands.

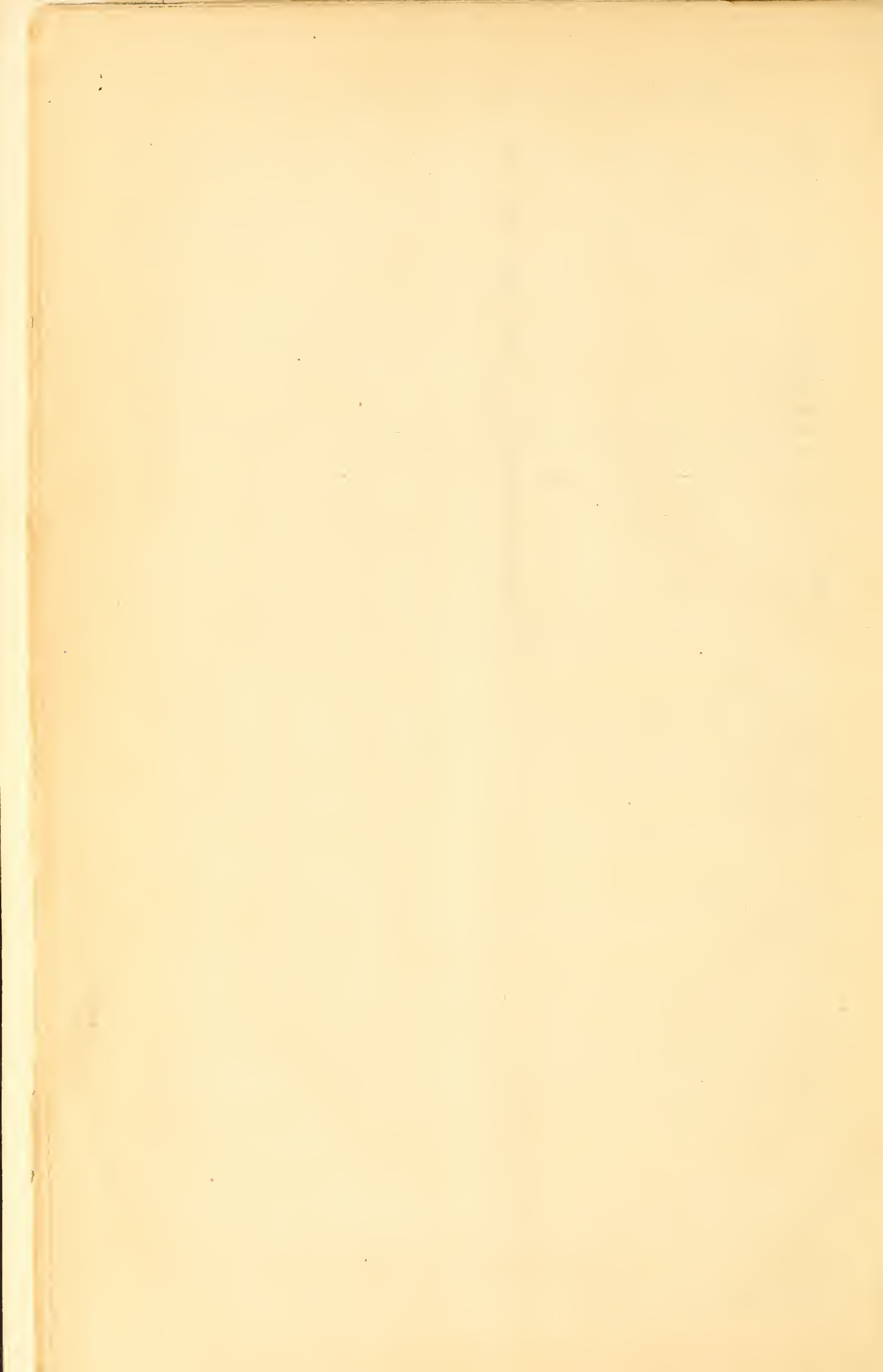
4. Capital, to improve and clear up lands and "set things to rights," to erect and thoroughly equip sugar-houses, build tramways and lines of communication by means of which lands remote from water-courses may be carved into farms, and to introduce the most approved agricultural and manufacturing appliances.

5. Improvement of cane-seed through importations from other latitudes, to be distributed among the planters of the State.

6. In view of the great importance of securing a maximum amount of juice from the cane and the most desirable methods of manipulating it after expression, in order to produce a superior article of commerce, the appointment of practical chemists to study the operations of manufacture on the ground. These also to analyze the soils, provide means for converting the "trash cane" into a fertilizer, and to suggest such other fertilizing means as may best conduce to the re-establishment of weakened or exhausted soils.

7. The establishment of an agricultural college on the general plan of those at the North.

8. The establishment, by State aid or otherwise, of an agricultural station or experimental farm, for determining questions bearing upon the sugar-industry, since experimental tests conducted by individuals lack thoroughness, on account of the expense and time required to carry them forward to complete and reliable results.



## APPENDIX.

### EPITOME OF LETTERS FROM SUGAR-PLANTERS OF LOUISIANA.

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JOHN. D. MURRELL, Iberville Parish:

The national government should take our levees in hand and protect us from the disastrous annual overflows. It should also give us protection by placing a uniform tax of  $2\frac{1}{2}$  or 3 cents per pound upon *all* grades of unclarified sugars, and from 4 to  $4\frac{1}{2}$  cents upon clarified sugars imported. Immigration should be encouraged. Laborers are our great necessity, and with plenty of them, and the proper protection, the sugar-crop of this State would soon swell into hundreds of thousands of hogsheads annually.

CHARLES H. WALKER, of Walker & Thompson, Franklin, Saint Mary's Parish:

The lands best adapted to the cultivation of sugar-cane are all more or less subject to the annual overflow of the Mississippi, and their protection by the national government is imperatively necessary. \* \* \* We want to improve our seed-cane; the loss by spoiling is annually on the increase, showing that it is deteriorating. We need fresh importations from other countries, to be distributed in small parcels to the planters. \* \* \* We need more laborers. In the Teche country we pay from \$15 to \$25 per month for men and provide them house, garden, fire-wood, rations, half an acre of land in field, and team and half of Saturday to work the same. We pay from 50 to 75 cents per day for women, without rations. During sugar-making we pay \$1 per day and 50 cents for one-half the night. There are more wanted than are in the country. If the Department could spread this information among the freedmen in other localities where there is a surplus and where they cannot get remunerative wages, or if they could be assisted in emigrating from such places, it would benefit the freedmen and the country. \* \* \* Central sugar-factories are being established, where canes are purchased. The average price is \$5 per ton of 2,000 pounds, weighed at the factory. In some cases land and seed-cane are furnished by the factory, and \$4 per ton paid for canes. The average product of an acre of plant-canes, well cultivated, on fair land, is eighteen tons. \* \* \* We need a more thorough knowledge of the chemical constituents of our various soils and the requisite fertilizers to increase the product of sugar.

HENRY WARE, Iberville Parish:

The soil in this section of the country, for richness and durability, is not excelled by any lands in the world, a large quantity of which is now uncultivated, and a large part of that so badly as to produce but little over half crops. \* \* \* We need more capital and labor. If the large capitalists of the North and West could understand fully the large income to be realized from proper cultivation of these lands in sugar-cane, they would supply the needed capital. Labor would follow in abundance from different parts of the South, where both colored and white laborers are eking out a poor living on run-down lands in cotton and corn. \* \* \* We need a good levee system in the hands of the general government.

E. W. MOORE, Washington Parish:

Only a small proportion of the best sugar-lands of Louisiana have been put under cultivation, and a considerable part of these has since been rendered unfit for use by the destruction of our levees during the war, we being unable to restore or keep them up. Could the federal

government be induced to extend to us, in our present ruined condition, any assistance, not only in rebuilding our levees, but also in establishing a proper and thorough levee system, these abandoned acres would again be restored to the production of sugar, and there would be redemption of a body of alluvial land equal in extent to one-third the area of the whole State, superior in fertility to any other equal body of land in the Union, unexcelled by any in the world. \* \* \* It is a well-known fact that up to the time of the war the cultivation of all Southern agricultural products was yet crude and undefined ; but should the new appliances of drainage, deep plowing, fertilizing, and improvement in selection, which have enabled our farmers to quadruple yields per acre of their cotton and other products, be extended to the cultivation of the cane, at present prices of sugar the value of our increased production would be almost fabulous. \* \* \* The cost of the levee improvements would be trifling, compared to the immense benefits to be derived not only by ourselves, but by the whole country indirectly, to say nothing of the moral influence in healing past dissensions. \* \* \*

*The labor question.*—Our experience since the war has thoroughly exploded the old theory that sugar could be successfully and profitably cultivated by slave labor only ; also the erroneous impression that good white labor could not be employed in this warm climate. Under this theory, it would be difficult to explain the prosperity of highly productive countries in some parts of the world inhabited almost if not exclusively by the white race, situated much nearer the equator, and, consequently, in much warmer latitudes. My own experience, extending back to my earliest recollection, is that we have always had good white labor. The Western and Southwestern sections of this State have always been, with few exceptions, almost exclusively inhabited by the white race, among whom are many choice white laborers. \* \* \* Owing to the heavy labor required in the cultivation and manufacture of sugar, as a matter of economy, our experience has taught us the expediency of substituting machinery for manual labor wherever practicable. An advance in this direction before the war had made considerable progress. In this respect we not only led but placed ourselves far ahead of all sugar-producing countries, simplifying and cheapening all processes.

#### C. B. AUSTIN, Saint Mary's Parish :

The main question is how to obtain sufficient labor. In this respect we are deficient, and there is much diversity of opinion on the subject. Some advocate the introduction of Chinese ; many send agents to the Carolinas, Georgia, and Virginia ; but those negro laborers are generally inferior to our own as to work on a sugar-plantation. I only employ the Louisiana colored man. Some effort has been made to introduce a white element from the North and West, and I believe that ultimately, when the attention of our intelligent, industrious class of farmers is turned to this country, labor will be procured, and that of the right stamp.

#### JOHN B. PITTMAN, La Fourche Parish :

Encouragement of labor and capital is most needed to increase the production of sugar in Louisiana. There is abundance of land now lying idle, run to weeds. At present prices, sugar is the most profitable crop that can be raised. Many sugar-plantations for several years have been cultivated in rice, but the prices of rice are not sufficiently remunerative now. Reliable labor is scarce, even for the amount of cane now raised in the State.

#### L. G. ALDRICH, Assumption Parish :

I would suggest as follows : 1st. An importation of choice varieties of seed-cane to be placed in the hands of responsible parties who may take sufficient interest in the subject to devote their attention to acclimatizing them and obtaining the best results. 2d. A thorough and exhaustive analysis of the various fertilizers now being extensively used on cane, with a view to ascertaining which contain in most perfect form the elements essential in production of the component parts of cane and least destructive of the natural vitality of the soil, in order that we may be able to avoid the dangers which, to a certain extent, manifested themselves to the beet-growers of Europe, who, in order to obtain large results, fertilized to such an extent and with such material as to kill the land. In times past the fertilizer almost exclusively used was



the pea-vine, which produced the result desired, partly by decomposition of the vine and in part by the dense shade it produced; but now there is yearly a largely increasing use of cottonseed meal and other fertilizers, which, while they produce immediate grand results, will, in the opinion of many planters, work disaster to our land in the end.

NORBERT LANGUE, Saint Charles Parish:

In order to extend the production of sugar, according to the desire of the department, it will be necessary to put in a condition of culture the lands that have been abandoned since the great crevasses which inundated a considerable portion of the soil of Louisiana. These lands, formerly covered by abundant crops of the sugar-cane, now present to the view a vast and melancholy expanse of ruins and swamps, in which the waters of the Mississippi seem permanently to rest. I will cite but one example of the ruin of these lands, that of the destruction of my own and of some of my immediate neighbors. On my place, before the crevasse of Bonnet Carré, my crop ordinarily was from 200,000 to 300,000 pounds. The crops of seven of my neighbors were in the aggregate about 2,600,000 pounds. All these lands, as also those of thousands of others, adapted to the culture of the sugar-cane, remain uncultivated, for the reason that every year they are inundated by the waters of the river. The State has not the means of reconstructing the levees and closing the openings through which the waters come to drown the lands.

LEWIS GUION, Assumption Parish:

There is yet lacking confidence in the stability of our levees, which has discouraged immigration and sugar-production, and has caused a large area of the richest portion of the alluvial land of Louisiana to grow up in weeds. Should the government build up the levees of our inland sea, which washes the shores of so many States, and which has begun to be considered a national work, there will be an immense revival of the sugar-interest. \* \* \* We need more labor, and we can readily give employment to thousands of white men at remunerative rates, and whom we expect shall become owners of the soil, since large plantations are being rapidly divided, there being no longer here the ambition to possess large quantities of land that are unproductive. \* \* \* The Department can do a great deal of good by sending a practical chemist to Louisiana, about the 1st of October, to spend a winter in observing the modes of making sugar, the fertilizers employed and their effects, in analyzing the various soils, and especially suggesting some cheap and practicable mode of quickly converting the large mass of *bagasse* into a fertilizer, either by machinery, cutting it up into small particles after passing through the rollers, or by composting with some substance which would quickly decompose it at small expense. I believe it is entirely practicable to begin the use of tile-draining. If the department would try the experiment on a small scale on some sugar-plantation, I am satisfied the yield of sugar would be largely increased.

DANIEL THOMPSON, Bayou Teche:

Our seed-cane is undoubtedly very much deteriorated, as very little, if any, has been imported since 1861. If Congress can be induced to aid in the importation of some fresh seed, it will be of very great benefit to our planters. \* \* \* It may not be out of place here to state some of the influences which, I think, militate against a large production of sugar in Louisiana. It is a fact that the lowest lands that can be cultivated in cane in Louisiana are much the most productive. There are immense tracts of these productive lands, that were in cultivation before the war, that are now lying idle, in consequence of the inability of the State to rebuild and keep in repair the levees on the banks of the Mississippi River. Even if this could be done in Louisiana, it would not avail much till the levees on the Mississippi are rebuilt in the States of Arkansas and Mississippi. Another of our misfortunes is that larger quantities of foreign sugar finds its way into our market without paying full, if any, duties. \* \* \* In addition to fresh seed, I think the next greatest good to planters might be realized by the establishment in Louisiana of a State agricultural college, and the employment of a practical sugar-chemist to analyze our soils and the fertilizers we use, and to aid us with information regarding the manufacture of our sugar.

R. F. SPANGENBERG, Jefferson Parish:

The first thing necessary to be done to increase the production of sugar is to secure all the cultivable lands from overflow. The levees should be taken care of by the government. This one important step alone would insure immigration and capital. \* \* \* It would be well to employ Northern white labor on the levees, on the railroads (say Southern Pacific), and the canaling, formerly done by Irish and German; also, on the steamboats that ply on the Mississippi. This would give the sugar-planter the benefit of the labor of the negro on the plantations, where he is so well fitted for the duties of gang-labor. In harvest-time, when extra labor is required, the Northern white might be employed; and, little by little, he would learn something of sugar-planting, and finally be able to live on a plantation and make a crop on the share or tenant system—the only way in which to employ whites in sugar-culture, supposing them to be intelligent and thrifty, and ambitious themselves to be land-owners. This is the proper way in which to start new places and put new sugar-lands under cultivation. What is said concerning the whites not “standing the climate” is “all bosh.” All the gardening for the New Orleans market is done around me on small places by white men, who work intelligently and take their *siesta* between 11 a. m. and 3 p. m., thus avoiding work in the heat of the day; in fact, I do the same *to save my mules*, to say nothing of the advantage to my negro laborers. Again, all heavy work is done by July, as then the sugar-crop is *laid by*. Having traveled seven years in Europe, I saw what white labor did there in the southern parts. This place includes 4,000 acres of land; 1,000 are in pasture, corn, and cane; say 340 in cane. Aiming at 1,000,000 pounds of sugar next year, I shall roll only 200 acres, reserving the 140 to make a large planting. With a fair season, these 200 acres should give me at least 400,000 pounds of refined sugar (white and yellow clarified), worth, at present prices, including molasses, between \$45,000 and \$50,000. Cost of making and staking off, \$25,000 (including any permanent improvement); showing a profit of 80 to 100 per cent. on the outlay to make the crop. I have the most improved machinery invented, put up last year; sugar-house and machinery worth \$50,000.

E. D. BARTON, Napoleonville, La.:

The most essential thing for the promotion of sugar-culture in the State are, 1st, a good levee system; 2d, good drainage; 3d, increase of labor.

JOHN H. RANDOLPH, Iberville Parish:

Louisiana might make enough sugar for the whole United States if all our swamp-lands were cleared up and drained and substantial levees built on the Mississippi River.

F. S. BARBOUR, Plaquemines Parish:

Induce the government to take charge of the levees, and send us some of the surplus labor of the North to rebuild them and make them safe, then capital would come and labor would follow.

VINCENT BOGUE, Saint Landry Parish:

We want industrious white men, but men who will come to us with a sense of duty.

MARTIN GLYNN, West Baton Rouge Parish:

The only material aid the government can give toward increasing the production of sugar in Louisiana is to build levees. I expect to make 300 hogsheads of sugar this year. In three years I could increase the amount to 1,200 were I secure from overflow. \* \* \* Some think a change of seed would be an advantage; but with security from overflow we can make large crops with the cane we have at present.

A. J. J. BARRIS, Terre Bonne Parish:

I am the proprietor of three plantations in this State, and am unable to cultivate any of the three on account of overflows, nor am I the only one so situated. There are thus thousands

of pounds of sugar annually lost to our markets, thereby increasing our sugar importations and losing to the country millions of dollars. In my opinion, the efficacious mode of avoiding this loss is for Congress to make some special appropriations for the building and protection of our levees, the government retaining control of them. This, I firmly believe, is the best and only way by which our sugar-interest can be promoted and our importations diminished

F. L. CLAIBORNE, Point Coupee Parish :

The sugar-lands of Louisiana can be made to produce all the sugar that is required for consumption in the United States, and to spare. It is true the sugar-cane belongs to the tropics; it is an exotic here; but American skill, industry, and inventive ingenuity, and improved and improving modes of cultivation, will enable the Louisiana planter to make as much sugar as can be extracted from cane anywhere else. \* \* \* A commission of three practical and intelligent planters should be sent to where the cane is indigenous to import selected seed for equal distribution among all the sugar-planters of the State. \* \* \* There is cane-land enough in Louisiana to make one and a half million hogsheads of sugar, if the levees on the Mississippi are built up. Good and sufficient levees, capable of securing the Louisiana sugar-belt from overflow, can only be made through government aid. Let Congress aid us, and we will reclaim sugar-land enough to supply the United States and to export largely; thereby the cotton and sugar interests would be developed to so great an extent that in three years the government, through increased imports, would be reimbursed three times over, and the internal trade and traffic between the States would be enormously increased.

W. H. BALLARD, Ascension Parish :

The government could render us great assistance if it would send to the State several practical chemists during sugar-making to watch the process and to devise means for destroying the coloring matter and for removing the vegetable impurities existing in the cane-juice. In order to give our sugar and sirup a good appearance, we use the fumes of sulphur to destroy the coloring matter, which, when combined with lime that is used for removing other impurities in the juice, renders the sugar highly deliquescent, causing it run off in the shape of molasses. This entails considerable loss. It is also desirable to devise means by which to check fermentation in the molasses. It is rarely the case that planters pretend to know anything about the handling of the juice in order to make good sugar. Through proper instructions furnished, the government could accomplish a great good, saving us from an immense loss in handling the juice, and increasing the production of sugar correspondingly. Besides this, and the importation of new varieties of cane, I do not know that the government could particularly serve us.

JOSEPH ANGER, Iberville Parish :

Sugar-culture in *ante-bellum* times was by far the most profitable crop the farmer could cultivate, and since the war it has proven even more so. I have been a practical sugar-planter for forty years on the Mississippi, and through many vicissitudes, without much loss. I find our methods of production and manipulation susceptible of great changes. As to the best method of promoting this great and growing interest, the first step must be taken by the government in the reclamation of the low lands, upon which, principally, sugar-cane is grown. The country especially adapted to sugar-culture is that portion of the alluvial region bordering the Mississippi below Vicksburgh. The present producing capacity of our State, by a proper system of national levees, can be increased 300 per cent. \* \* \* Fifty years' experience in this State has demonstrated the utter futility of the State attempting to keep up its own levees. Legislation of a national character is necessary to a reclamation of the low lands. Suppose all the riparian and interior communities of this State were protected from the Mississippi south of the Arkansas line, the levees above being in bad condition, if a break occur the water will come south through the Yazoo Valley on the one side and break through the Bayou Macon Hills from the Saint Francis Valley on the other, flanking the whole interior, and rendering a supposed good system south wholly a nullity. \* \* \* With the fostering care of the government extended to our levees, local capital and increasing good labor will

soon place our section in the foremost rank of sugar production. \* \* \* Government might assist us in the way of importing tropical seed, as some of our cane has very much degenerated. \* \* \* My lands readily yield me a net income of \$60 per acre.

JOHN DYMOND, New Orleans:

I would suggest one thing that I think of grave importance, and that is, the determination of some method of outlet-drainage by a combination of small proprietors. Thus far large estates have been the rule in Louisiana, and the outlet-drainage has been obtained by digging large canals long distances to lower levels, or by digging canals and elevating the water from the same and throwing it over and beyond the rear protection levees by means of large drainage-wheels, such as are used in Holland. I have just erected one of these wheels, which will throw out about 50,000 gallons of water per minute, and the wheel, engine, boilers, foundations, &c., and about  $\frac{3}{4}$  mile of canal, 20 feet wide and 5 feet deep, have cost me \$15,000 cash. It is this drainage matter that interferes with small proprietorships in Louisiana. In Holland they organize local drainage districts, calling them *Polders*, and they are duly surveyed, inclosed by levees, or dikes as they are called, and duly drained by steam or wind wheels. This I understand to be done by commissioners elected by the proprietors, and managed perhaps as a bank or incorporated company, under the so-called *Polder* laws, the cost being assessed on all the land inclosed within the *Polder*. I own many thousand acres of land in Louisiana, and all that is under cultivation is drained five feet below the level of the land artificially, at an expense of less than \$3 per acre per annum. Not one-quarter of this land would produce good crops without artificial drainage. Should I sell forty acres, the purchaser would at once have his drainage closed, or be compelled to make some *temporary* arrangement with me, and hence but a few such sales have been made, and I do not see how they can be in the best alluvial lands, which are all low, until this problem is solved. They have been solving it in Holland for five hundred years, and, I presume, have a full code of laws in relation to the matter. I think you can hardly do any greater service to the sugar industry, and particularly to the freedmen and small proprietors, than by obtaining these laws and translating them into English, and circulating the same in Louisiana.

CHARLES STARR, Saint Martin's Parish:

Louisiana should produce sugar enough for the whole nation; but one great drawback is the want of capital, as the most of the planters were ruined by the war, and the reported violence, &c., of the people have deterred Northern men from coming in. So far as I can judge, and I have had exceptionally good means for information, no Northern man who minds his business has had any difficulty. I am well known as a pronounced republican, and openly voted for Hayes and Wheeler, and no one has given me the cold shoulder. It seems to me unfortunate that the treaty with the Sandwich Islands admits sugar free, for two reasons: First. I had been informed that the farmers of California were going largely into beets for sugar, it having been ascertained that the climate and soil of that State were exceptionally favorable for sugar-beets. As a result of the treaty that enterprise, I am informed, has been abandoned. Second. Although the area of land for sugar-cane in those islands is not very large, the area for fraud seems to be unlimited. No doubt attempts will be made on an immense scale to land cargoes of East India sugar there, refine it, and ship to the United States and elsewhere. It is true that the consuls and others may have instructions from the government to look closely after the matter, but the inducements for fraud will be enormous, and it will take a good deal of virtue to withstand them. In answer to the inquiry, "Why cannot sugar be raised in small quantities by the negroes and others, and small or portable mills and evaporators be used for manufacturing the same?" I reply, that the best mills, with steam-power, do not get more than two-thirds of the saccharine matter from the cane, and the horse-mills very much less, and consequently they are very wasteful. Various plans have been adopted to supplement the mills run by steam, and some of them, apparently, have made considerable gain; and as a good deal of invention is enlisted in the enterprise, we may fairly look for considerable gain in the product of the cane. The true interest of the small farmers is a

union for a good apparatus; or, where they are within reach of a steam-mill, &c., either to sell their cane or have it made up on shares. Around my plantation are many small planters, black and white, and they have had their crops made up at my sugar-house, and are increasing the production of cane and diminishing the cotton. This is the true policy, and will largely add to the production of sugar.

Messrs. A. THOMPSON & Co., New Orleans:

We have tried to gather and place in the hands of the Department all information in our power, in view to aid in furthering the interests of the production of sugar. The area of land adapted to the production of the sugar-cane is adequate to furnish the United States with enough sugar for their consumption if under proper cultivation. Taking the Mississippi River, from the parish of Pointe Coupée down to within a few miles from its mouth, both of its banks are lined the whole length with sugar-estates unequalled for the richness and fertility of the soil, especially the parishes of Ascension, Saint James, Saint John the Baptist, and Saint Charles, and below the city the parish of Plaquemines, known before the war as the Empire Parish for the richness of its productions, and now the great rice and orange growing parish of the State. We have also the lands along the Bayou La Fourche, a rich, black, and exceedingly fertile soil, and showing this year, so far, the largest canes and most promising crops. We must especially report that portion of the country formed of the parishes of Saint Martin and Saint Mary, along the Bayou Tèche, and known as the Attakapas region. Many Northern and Western capitalists, charmed by the beauty of the country and the salubrity of its climate and fertility of its soil, have purchased large plantations, and are yearly turning out paying crops, some of them shipping direct to Northern markets. Among these planters a few have introduced the system used in the French West India Islands of central sugar-mills, and are buying the cane grown in the neighborhood, thus enabling the small planter to raise a crop and sell it without expense of machinery for grinding, &c. If this system were more in vogue we have no doubt that a great portion of our uncultivated lands would be farmed out and cultivated by small planters, and add thereby greatly to the general prosperity.

There is one drawback, however. In the tropical countries the grinding is not interfered with by cold weather, while in Louisiana it has to be got through in the shortest time to avoid frosts, &c., and the country is yet too sparsely populated to furnish enough of material for these mills to be worked with success; but, however, some of the large planters are beginning to try this system of buying canes outside of their own crops and grinding them in their mill. We have also to mention the sugar-producing regions of Red River, composed of the parishes of Rapides and Avoyelles, where the culture is increasing every year, producing a good sugar and a rich, thick molasses, reddish in color, and unequalled for grocers' trade. We would recommend that your Department publish in some pamphlet form statistics showing the advantages of sugar-producing districts in this State, and thereby insure immigration to a magnificent, fertile, and most healthy part of the United States. The yellow fever, which is sometimes brought to this city by vessels from Cuban or South American ports, seldom extends into the country; and New Orleans is this year, according to statistics, the healthiest city in the Union. We would also suggest that the Department afford to sugar-planters all facilities of knowledge of improvements here and in foreign countries on boiling and making sugar, and especially experiments in manuring and fertilizing the land, &c., and that the government establish a chemical laboratory to analyze the different soils, and give information as to the proper fertilizers required to increase the growth of the cane. It could be established in the custom-house or other central government building in this city. This we consider one of our greatest needs. The government should, through its agents abroad, procure seeds of the different kinds of canes, and distribute the same among the planters, or sell it at a nominal price. Experiments could then be made to test the best kind adapted to the soil and climate. We have ourselves made experiments on the Bourbon and Java or ribbon-cane, and find that the latter has nearly doubled the yield per acre; *i. e.*, where we made 1,200 to 1,500 pounds of sugar to the acre before using the ribbon-cane, we have doubled the quantity since using it, and furnish our own experience, which we trust may be useful for the planters at large. The Otaheite cane was largely cultivated before the war, but has since degenerated. It is very

sensitive to frost, and has been replaced by the Java and Bourbon on that account. Your attention is especially called to the above, as the want of good seed-canes is one of the most pressing of our planters, and we think that the government, with its numerous agents, is naturally the one whom they should look to in this matter. Many planters, as their means increase, are leaving the old system of open kettle and adopting the vacuum pans and centrifugals, thereby increasing the quantity and improving the quality of their products, and, by the employment of an adequate number of mechanics to attend to this more intricate machinery, are adding to the general prosperity. The fears of crevasses or overflows have from year to year caused serious apprehensions among the planters on the Lower Mississippi. The Bonnet Carré crevasse (not yet closed) has ruined many a planter and brought desolation on several hitherto fertile and rich estates. In view of this we strongly recommend that the general government take entire charge of the levees and place them under the control of officers of the United States Engineer Corps. We think the present system of determining the classification of sugars imported from foreign ports detrimental to Louisiana sugars, inducive to fraud, and not proper to fully ascertain the exact grade of the sugar, and would seriously recommend that the test be made by polarization as well as color, else we do not see how it is possible to arrive at anything like a correct or definite classification. One of our present utmost needs is labor, which is scarce and wanted. There are sugar-lands along the Gulf coast which are now lying in waste and unproductiveness, not only in our own State but also in Alabama, Florida, and Texas, and if labor could be had and the surplus population of Northern cities be made to understand the cultivation of these lands it would add greatly to the prosperity of the country at large. The colored laborers are working well, being promptly paid, and as a general rule all intercourse between the planters and their hands is as desirable as can be. We are ourselves owners of a large plantation below the city, employing quite a large number of hands, and find them happy and contented, never giving us the least trouble, and working well. In conclusion, we will say that we are pleased to see the government trying to promote and encourage what will be one of the largest agricultural products of the country, and we shall take pleasure in furnishing the Department with all the information in our power concerning the coming crop, which so far promises well and will probably exceed the late one by about 5,000 to 10,000 hogsheads, with an average yield of molasses.

D. W. BRICKELL, New Orleans:

For half of October and all of November and December we want a large number of good workmen to help take off our crop of cane. We want them for both indoor and outdoor work; and, to extend our operations, we shall want them afterward. \* \* \* Beyond question, white immigration is necessary to the development of the country, as the development must take place on the system of small farming and central sugar-houses, the growth and the manufacture of sugar being separate industries. But immigrants who come here and go to work for wages with the large planters for one, two, or three years will be best off; as, while becoming used to the climate, they are learning all about cane cultivation and are laying up something to make a beginning themselves. \* \* \* Although making sugar on a large scale is fairly profitable to the large planters, it is infinitely more so to the small ones, especially those who take their cane to another man's mill and keep their capital in the culture. The western farmer knows no business so profitable. We of the South always knew that the white man could work here as well as the negro.

JOHN C. COFIELD, Ascension Parish:

An obstacle in the way of the production of sugar in this country is the expense of the machinery required in the re-establishment of the old plantations devastated by the war, and few persons are willing to incur such heavy expense without some assurance that the laws will be permanent and their investments secured against changes in the policy of the government. Many plantations, also, now cultivated in cotton, might be transformed into sugar-cane, and in a very few years enough sugar could be produced to supply the entire consumption of the United States. \* \* \* Sugar-planting does not admit, unless in very favorable situations, of the raising or growing of our own supplies of provisions, and our food, machinery, &c.,

must be supplied chiefly by the Western and Northern States. On that account there is a reciprocity of home interests to be obtained by the enactment of permanent revenue-laws to encourage the production of sugar. The greater the number of plantations brought under culture, the greater demand will there be for provisions and machinery from the West and North.

SAMUEL CRAGIN, Terre Bonne Parish.

Anything the department can do to introduce a cheap and good fertilizer suitable to our soil and crop would greatly stimulate the sugar-industry.

J. M. HOWELL, La Fourche Parish:

Nine-tenths of the sugar-lands are subject to overflow, and as the growing of a sugar-crop requires the expenditure of a large amount of money, people are loth to engage in such enterprises on a large scale with the little protection they now have against the disasters of an overflow.

H. VON PHUL, East Baton Rouge:

The first matter for consideration, for it is vital in importance, is the immediate adoption of a new and important levee system; one that will be complete and satisfactory in all its details. You are doubtless aware that under the old *régime* the riparian proprietors were obliged to build and keep in repair their levees. Since the war, owing to our impoverished condition and the ravages entailed by the war, this system was found impracticable. The State resorted to a general levee tax; but this system, owing to a bankrupt treasury, depreciated State bonds, and, I fear, dishonest State officials, has resulted most unfortunately, and was found to be futile. Our last legislature again threw the responsibility of maintaining our levees upon the riparian parishes; but this, for reasons given above, will be found impracticable.

The opinion is now general that, owing to the impoverished condition of the South, it will be impossible for her to build and maintain her levees without the aid of the general government; and as this important subject has been, and will again soon be, before Congress for consideration, I respectfully refer you to our petition for full particulars on this important subject, which I think cannot be regarded otherwise than as national. We therefore hope that the general government will either build and maintain the levees along the great highway, or lend aid in so doing. This done, and minor subjects receiving due attention, the prosperity of the South and the sugar-interests of Louisiana would rest upon a solid foundation. Then, and then only, would be realized the most sanguine expectations; in short, with our climate, soil, and great natural advantages, there would be no estimating her capacity or the limit to her resources.

Second in importance to our levees, I regard the immediate establishment, by State aid or otherwise, of an agricultural station or experimental farm. We live in an age of wonderful progress and general improvement, and it is important that agriculture should keep pace with this onward march. Individual experience is too slow for the times; particularly is this the case for a satisfactory and successful progress of the sugar-interests; but with the aid of an experimental farm important facts could soon be established, the benefits of which to the planters and State could never be fully estimated. Up to the present time few intelligent experiments have been made in the general cultivation of the sugar-cane. This is not, in my opinion, owing to a want of the proper disposition or want of intelligence on the part of the planters, but owing chiefly to the great expense and risk that such experiments entail.

With the aid of well-conducted experimental farms, the following information could, in a few years, be given, the beneficial results of which would be incalculable:

- 1st. What is the best time, and what the best method, to plant cane?
- 2d. What is the best time, and what the best method, to secure seed-cane?
- 3d. What is the best method of securing ratoon and stubble cane?
- 4th. What is the best method of cultivating plant-cane?
- 5th. What is the best method of cultivating ratoon and stubble cane?

6th. What is the best method of cutting cane for the mill, with the view to the future preservation of the plant or stubble?

7th. Is not the practice, now in general use, of hilling cane detrimental, cutting cane-roots injurious, &c.?

8th. Is not flat cultivation of the cane in accordance with its natural growth, and hilling, as now practiced, injurious?

9th. What is the best method of rotating for cane-crops?

10th. Which is preferable, machine or hand hoe for digging off stubble-cane?

11th. Which is preferable, machine, horse-hoe, or hand-hoe, for "laying by" plant-cane?

12th. What is the best fertilizer for cane?

13th. What is the best method of feeding a cane-carrier so as to obtain from the mill the best results?

14th. What process for extracting the cane-juice by the aid of the mills now in use is preferable?

15th. Can cane-juice be improved by settling in tanks or otherwise; if so, what is the best method, and how long should it stand?

16th. What is the market-value of sirups (density and polarization being given) as compared with sugars?

In my remarks regarding the cultivation of the cane and how best to extend the same, I shall not enter into details of the operation, which is familiar to most persons interested, but shall simply make mention of what I regard the errors of the present system, and will preface my remarks by observing that the genius of American agriculture is too superficial. We want better farming, less area of land; in short, we must cultivate better and do more of it than formerly. How this is to be accomplished is the question that must be solved satisfactorily before we can hope for a decided improvement or extension. All lands intended to receive plant-cane must be thoroughly broken by at least four mules, with the best improved plow, and in the fall, if possible. Deep plowing is indispensable, for upon it depends the successful use of the present highly-improved agricultural implements, now happily within reach of all that desire them, and by the aid of which we can readily pulverize the soil and keep it in the desired condition.

I am fully assured of the fact that no class of men are so "wedded to their idols" as the farmer and planter. "My father was a successful planter; he cultivated his fields thus and thus, using such a plow and hoe (that everlasting hoe); he made good crops. It is true that lands were fresher than now; but I respect his memory, and shall ever do as he did." This, I believe, is the argument of all the good old planters and farmers of the country. But, with all due respect to them and their inherited opinions, we must acknowledge that times have changed, and we might as well ignore the steam-car and return to the old stage-coach as adhere to that everlasting hoe and plow. It is a popular error to adhere to and rely exclusively upon the plow and hoe. The same results can be accomplished by the use of the present improved agricultural implements, and at much less cost.

To illustrate: one man, under favorable circumstances, will dig off the soil from, say, one acre of stubble-cane in one day. Now, with the aid of an improved stubble-digger (such as I have used for the past three years), one boy, seated on the machine, and two mules will accomplish the same amount of work in one hour; and, in my opinion, the machine-work is infinitely preferable. Again, one man can lay by (that is, give the cane the last working), say, one acre of cane; with the aid of an improved horse rotary hoe this amount can be accomplished in thirty minutes, by the aid of two mules and one man, the operator riding and having a good easy time of it. I might continue my illustrations, but let the above suffice. What I wish to impress upon the planters of the South is this: too much reliance is placed upon the hand-hoe, and our fields in consequence are badly, if not too expensively cultivated. Hand-hoeing is doubtless necessary for a foul drill, but only then; with middles kept in perfect order, that is, deeply and thoroughly pulverized by the aid of an improved cultivator, all the necessary work can be accomplished by the aid of improved implements, thereby lessening the expense of cultivation.

In order to reduce our expenses of cultivation, we must lessen the hand-hoe work. This can



be to a very great extent accomplished by increasing our team ; for each plowman we should have at least three mules. A full team and the use of improved implements will enable the planter to pass over his crops once every week. With regard to the manufacturing of sugar from the cane-juice, too much praise cannot be given to the sugar-planters of Louisiana. They have, indeed, exhibited a high order of intelligence, spared no expense to perfect their machinery, and to-day Louisiana, with just pride, can point to her marvelous achievements. Her sugar will compare favorably with, if it is not superior to, any other made. But while the manufacturing of the cane-juice into sugar has been perfect, I cannot help thinking that our planters have sadly neglected other points connected with this branch of the business. I regret to say that there is yet a great want of diligence and proper exercise of judgment in the general management and use of the cane-mill. For the past two seasons I have had occasion to visit some of the largest and best-appointed sugar-houses in the State. These establishments were manufacturing beautiful sugar, the apparatus for manufacturing being faultless, yet I cannot but express the opinion that not one of those I visited was returning fair or satisfactory results. I found, as a general rule, mills running at too great speed, great negligence in feeding cane-carriers, the *bagasse* absorbing in its exit from the mill large quantities of juice. Few mills in the State are realizing for their owners over 60 to 65 per cent. of cane-juice. This loss can in a great measure be reduced by proper attention to the adjustment of the mill and great care in feeding the cane-carrier, so as to deliver the cane to the mill in a continuous and uniform quantity. Having given this subject close attention, I have found the best results by adjusting the mill to receive the canes from the carrier only one cane deep, but uniformly spread over the entire surface of the carrier. In this way the supply of canes enters the mill regularly, and if the supply is continuous, the pressure exerted by the mill is uniformly exerted to its utmost capacity. Should the planter find that by such a feed he cannot keep a supply of juice sufficient for his daily necessities, he will find it greatly to his interest to dispose of his mill for one of greater capacity. It is a well-known fact that no mill has yet been devised that will extract all the cane-juice known to be contained in the cane, the best practicable results, as remarked above, being from 60 to 65 per cent., but I believe that a large majority of the planters do not realize over 50 per cent. To meet this difficulty, we here present to the consideration of those interested several new processes.

1st. The Robert diffusion process, which, I regret to say, proved unsuccessful.

2d. The Mason process, which I believe possesses many advantages. In this process the inventor deals with the *bagasse* after it has left the first mill, and then saturates the *bagasse*, after which it is carried to a second mill and again subjected to a great pressure. By this process the inventor claims an increase of 15 to 20 per cent. of juice over the old process.

3d. The Mallon process. This process has been in operation for the past three years on Hollywood, and for simplicity and insignificant cost recommends itself to all interested in the sugar interest. The apparatus consists in placing a perforated steam-pipe in the cane-knife or return-plate, and applying steam direct from the boilers to the cane while passing through the mill. The inventor claims an increase of 20 per cent. over the old process ; and the practical experiments at Hollywood demonstrate that 72 per cent. has been obtained from old stubble-cane and 74 per cent. from plant-cane. The cost of making this application to the mills as now used is about seventy-five dollars.

I believe that the cane-planting interest is fully alive to the importance of improving the lands by judicious fertilizing ; yet the question of the best fertilizers for cane is not easily determined. Guano, stable-manure, cotton-seed, and cotton-seed meal, and other spent manures, will make all plants grow with luxuriance ; but which is the best fertilizer for the formation of rich saccharine in the sugar-cane is a question yet open for further experiment. From all I can learn upon this subject, I am of the opinion that the formula of Mr. George Villé is the best ; the component parts of which are phosphate of lime, nitrate of potash, and sulphate of lime, in due proportions.

There is yet another subject well worthy of due consideration of both planters and capitalists, which is this : There are comparatively few planters who are provided with the present improved apparatus for manufacturing sugar. The large majority of planters, owing to pressing necessities, still adhere to the old and wasteful system of open kettles. In estimating the

cost of manufacturing sugar upon the improved apparatus of the day, we find it to be very great, requiring an expenditure of not less than \$20,000, an amount that would purchase a large and valuable sugar-estate. I am of opinion that, for this reason, if for no other, the manufacturing of sugar on most of the plantations should be greatly modified; in fact, I will go further, and state that, with the necessary capital and ordinary business competition of refineries located at New Orleans, it would be found more profitable to convert cane-juice into well-concentrated sirup and ship direct to market. The advantages of this system would be very great. First, the open kettles, the steam-trains, and the small evaporating-pans in use upon the majority of the plantations can make sirup equal in refining quality to that produced by the most approved apparatus, as it is only in the last stages of the operation of sugar-making that the sirup or sugar is damaged and inferior sugar made. By simplifying our present method of converting our cane-juice into sirup, say, to a density of 30° to 35° Beaumé, we would greatly lessen the expense of manufacturing; we would require less fuel, would dispense with skilled labor, with coolers, with long delay in potting and in the purging-room, and the great loss in waste and leakage in cisterns and elsewhere. Finally, but not least, we would save much time in taking off our crops, to say nothing of the fact that our produce would be ready for market a few hours after leaving the evaporators. The only objection I can see to the adoption of this system and its practical working is the want of a market for the sirup. If capitalists would erect refineries in New Orleans, and assure planters that they would pay fair prices for their produce in this shape, I cannot help thinking it would be mutually profitable. The sugar-planter would get the full value of his produce, and the refiner would have his stock in the best possible shape to be converted into any desired quality of sugar.

To extend our sugar-interests, we must lessen the cost not only of cultivation, but also of the necessary apparatus for taking off our crops, and if this system were once established, it would, in my opinion, give a great impetus to business, both to refiners and planters.

#### SUGAR PRODUCTION OF THE WORLD.

Bouchereau, in his Annual Sugar Report for 1876-'77, quotes from an eminent English authority the following tables showing the production of cane and beet-root sugar in 1875 in the producing countries of the world:

##### CROPS OF CANE-SUGAR, IN ROUND NUMBERS.

	Tons.		Tons.
Cuba .....	700, 000	Louisiana .....	75, 000
Porto Rico.....	80, 000	Peru .....	50, 000
British, Dutch, and Danish West Indies .....	250, 000	Egypt .....	40, 000
Java .....	200, 000	Central America and Mexico.....	40, 000
Brazil .....	170, 000	Reunion .....	30, 000
Manila .....	130, 000	British India and Penang .....	30, 000
China.....	120, 000	Honolulu .....	10, 000
Mauritius .....	100, 000	Natal.....	10, 000
Martinique and Guadaloupe .....	100, 000	Australia.....	51, 000
Total tons .....			2, 140, 000

##### BEET-ROOT SUGAR.

	Tons.		Tons.
German Empire.....	346, 646	Austria and Hungary.....	153, 922
France.....	462, 259	Belgium .....	79, 796
Russia and Poland.....	245, 000	Holland and other countries.....	30, 000
Total tons .....			1, 317, 623

The following extract is taken from "A Complete Treatise on the Fabrication and Refining of Beet-Sugar," by L. Walkoff, "proprietor and fabricator of sugar at Kalinowka, Podolia, and member of several learned societies." This work brings up its statistics only to 1872-'73.

SUGAR PRODUCTION IN DIFFERENT COUNTRIES IN 1872-'73.

Countries.	Number of factories.	Weight of sugar-beets.	Quantity of sugar produced.
		<i>Kilograms.*</i>	<i>Kilograms.*</i>
France .....	487	.....	400,000,000
Germany .....	304	3,050,645,600	260,000,000
Russia .....	318	2,140,000,000	} 150,000,000
Poland .....	.....	.....	
Austria .....	220	2,135,000,000	205,000,000
Belgium .....	117	.....	80,000,000
Holland .....	29	.....	.....
Sweden .....	6	} 20,000,000	†35,000,000
Italy .....	2		
England .....	1		
America .....	2		

\* A kilogram is equal to 2.204737 pounds.

† This is evidently a clerical or typographical error, as it makes the sugar produced nearly double the quantity of the raw material from which it was extracted. There are no indications that the countries of which this aggregate is reported received any supply of raw material from abroad. It should, probably, read 3,500,000 or 350,000. Sugar-beets are, in many localities, raised for stock-feed.

COMPARATIVE BEET-SUGAR PRODUCTION.

Countries.	1868-'69.	1869-'70.	1870-'71.	1871-'72.	1872-'73.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
France .....	213,904	289,324	289,083	330,000	400,000
Zollverein .....	208,140	217,192	262,987	182,500	260,000
Austria-Hungary .....	101,602	151,354	182,280	162,500	205,000
Russia and Poland .....	87,500	132,500	135,000	90,000	150,000
Belgium .....	37,078	43,552	55,739	75,000	80,000
Holland, &c .....	10,000	12,500	17,500	25,000	35,000
Total .....	658,224	846,422	942,589	865,000	1,130,000

## LANDS IN THE SUGAR-PARISHES OF LOUISIANA—CENSUS OF 1870.

Parishes.	ACRES OF LAND.		
	Improved.	Unimproved.	
		Woodland.	Other unimproved.
Ascension .....	40,091	40,716	.....
Assumption .....	39,895	52,854	1,490
Avoyelles .....	38,523	67,952	17,328
East Baton Rouge .....	50,355	100,084	4,110
East Feliciana .....	73,545	84,765	23,705
Iberia .....	19,244	25,324	36,208
Iberville .....	32,812	49,755	103,315
Jefferson .....	17,806	12,434	46,757
La Fayette .....	58,105	11,732	44,342
La Fourche .....	32,820	60,390	20,145
Orleans .....	4,603	3,120	6,725
Plaquemines .....	36,777	15,813	81,663
Pointe Coupée .....	38,166	48,556	37,078
Rapides .....	63,265	145,912	16,989
Saint Bernard .....	7,648	10,591	12,568
Saint Charles .....	15,330	16,734	5,934
Saint James .....	26,513	59,762	17,989
Saint John the Baptist .....	19,880	23,274	8,585
Saint Landry .....	80,452	141,449	90,877
Saint Martin's .....	33,776	32,646	37,887
Saint Mary's .....	43,564	61,890	24,008
Saint Tammany .....	1,978	22,083	.....
Terre Bonne .....	36,693	64,913	28,885
Vermillion .....	11,524	3,758	44,042
West Baton Rouge .....	21,628	25,369	8,332
West Feliciana .....	28,810	62,637	29,277
Total .....	873,805	1,235,515	748,539

## M. S. BRINGIER ON BAGASSE.

NEW ORLEANS, *September 8, 1877.*

DEAR SIR: Permit me to lay before you the result of a sugar-crop in Louisiana, and make upon it a few remarks.

Three hundred and seventy acres land produced 14,368,338 pounds cane, or 38.201 pounds per acre; this, put through the mill, yielded 8,021,304 pounds—55.8 pounds juice per 100 pounds cane. This juice evaporated left, in masse cuite, sugar and molasses 1,190,987 pounds; 6,730,317 pounds water were evaporated and 2,838,430 pounds coal employed; so that each pound of coal only evaporated 2.37 pounds of water.

Masse cuite .....	1,190,987 pounds = 8 29 pounds per 100 pounds cane.
First sugar .....	454,989 pounds = 3.17 pounds per 100 pounds cane.
Second sugar .....	220,490 pounds = 1.53 pounds per 100 pounds cane.
Molasses .....	515,508 pounds = 3.59 pounds per 100 pounds cane.
Masse cuite .....	= 14.85 pounds per 100 pounds juice extracted.

Now, 14,368,338 pounds cane contain at least 12,931,505 pounds juice. The last season the juice was very rich, and contained, at a low calculation, 18 per cent. masse cuite; but say that only 17 per cent. of it could be obtained, then  $12,931,505 \times .17 = 2,198,355$  pounds masse cuite should have been obtained, and not 1,190,987.

The 1,007,368 pounds loss would have cost only the fuel employed in its manufacturing to evaporate 5,738,000 pounds of water; "one pound of coal should easily evaporate six pounds of water;" 956,440 pounds of coal, or 5,314 barrels, should do the work.

This is equal to .....	\$2,657 00
500 hogsheads, \$3.50, \$1,750; barrels, 700, \$1.35, \$945 .....	2,695 00
Manual labor for centrifugals, &c .....	648 00

6,000 00

604,412 pounds sugar, at 10 cents.....	\$60,441 20
402,947 pounds molasses, at 3 cents.....	12,089 41
	\$72,530 61
	66,530 61

This would be twice more money than was cleared on the crop. Now imagine what is the loss and at what price sugar can be made.

Very respectfully,

M. S. BRINGIER.

Mr. W. G. LE DUC,  
*Commissioner of Agriculture, Washington, D. C.*

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[From the Department Monthly Report, January, 1873.]

SUGAR-MAKING IN THE FRENCH WEST INDIES.

A system of central factories has been adopted within a few days, in the French West India islands of Martinique and Guadeloupe, for the manufacture of sugar. The system is a substitute for the long-practiced method of making the sugar by individuals upon the plantations where the cane is produced. The design is to separate agriculture from manufacture, and by a concentration of capital, somewhat upon the co-operative system, to accomplish what the isolated planter was unable to do. The experiment, made upon a large scale during a series of years, it is maintained, has fully demonstrated the soundness of the principle. The central factories, or *usines*, as they are called, are owned by joint-stock companies, by which the sugar-cane is taken from the plantation and transported to the mill upon railroads, or tramways, constructed by those companies, a certain per cent. of the value of the cane being allowed the planter, the price being regulated by the market at Point-à-Pitre at the time the cane is delivered. The system seems to have proved a success, affording to the manufacturing interest a handsome profit, and, by leaving the planter free to devote himself to his peculiar vocation, largely increasing the cultivation of the cane.

The government of the island of Jamaica recently appointed a commission to visit the French islands, and inquire into the working of this central sugar-factory system. The Department of Agriculture has received, through the Department of State, the report of these commissioners: Their examinations were made during the last summer, and the results, as stated by them, are not without interest and value to the sugar-producers of the United States.

The largest central factory in the French islands is that which is commonly called the "Usine d'Arboussier," at Point-à-Pitre (Saint Louis), the chief commercial station of the island. The factory is in the suburbs of this sea-port, and is constructed upon the grandest scale, having all the improvements in machinery and the manufacture of sugar devised by modern science. The cost of it was upward of a million of dollars, and its capacity of manufacture is equal to 10,000 tons of sugar during the first six months of the year, which is the manufacturing season. The process of manufacture, as described by the commissioners, is as follows:

"The canes are brought by the planter to a siding of the main tram-way on his estate. The wagon generally carries two tons of canes, and one mule on a good level ordinary tram-way can draw easily two wagons. The wagon, when brought to the mill itself, conveys the canes to the rollers. The *bagasse* being elevated by power to a platform over the boilers, the juice, on leaving the mill-bed, falls through three strainers into a tank, which has a double bottom, heated by steam. It is treated here with a little bi-sulphite of lime, and is then run into a montejus. This montejus, by steam, sends the juice up to the clarifiers, where it is heated in the ordinary way and tempered with lime properly. From this it is passed to the charcoal-filters, through which it gravitates, and then passes by a gutter into a receiver. From this it is passed to a montejus and is thrown up by steam into a cistern over the triple-effet. From this cistern it gravitates into the triple-effet, passing from the first to the second, and

from the second to the third boiler, as the attendant wishes. When it leaves the boiler it is immediately passed over new reburned charcoal. It gravitates through this and falls into another receiver, from which the vacuum-pan takes it up and boils it to sugar. The first-quality sugar is generally crystallized in the pan, and is then dropped into sugar-boxes, which stand seven feet from the ground; under these boxes a little charging-vessel runs on a railway that is hung from the bottom of the said boxes, and this vessel conveys the sugar over the centrifugals, where it is cured; the molasses from this being boiled up, when found in good condition, with the sirup of the following day. When this molasses is thick and clammy it is boiled into a jelly by itself and dropped into sugar-boxes, where it is allowed to granulate for a number of days. This makes the second-quality sugar, and the molasses from this along with the skimmings and subsidings of clarifiers, goes to make rum. The juice that leaves the clarifiers does not pass over fresh charcoal, but follows the sirup from the triple-effet, thus assisting to wash out the sweets which may have been left by the sirup.

“The weight of canes delivered at the factory last year was 75,000 tons, although it was a season of drought. The factory can receive 100,000 tons a year. Last year 5,325 tons of sugar were obtained from 68,725 tons of cane, or about  $7\frac{3}{4}$  per cent. In April last the factory company declared a first dividend of 24 per cent. In other words, a net profit of \$181,585 was made upon the manufacture of 68,745 tons of sugar and 182,798 gallons of rum.

“The processes of manufacture in all the factories, both in Guadeloupe and Martinique, are identical, the only difference being the adoption in the new factories of the appliances of modern science, and improved mechanical and other arrangements. The clarification of the juice, its reduction to sirup at a low temperature, the perfect crystallization and color of the sugar, and a maximum return, are obtained by repeated filtration through animal charcoal, the ‘triple-effet’ and vacuum-pan processes, and, last of all, centrifugal machines. In Martinique the mean weight of canes was found to be equal to 28 tons per acre, producing, say,  $2\frac{1}{4}$  tons of sugar, and the sugar sells at \$200 a ton.

“The central factories, or usines, are represented as in the highest popular favor. Capital, both local and in France, is freely subscribed to establish new usines upon a large and extensive scale. Eight of the factories, at considerable cost, have been erected within the last two years, and others are now in process of erection. They seem everywhere, by increasing the facilities of manufacture, to have stimulated the planters to increased production of the cane. In speaking of the difference between the tillage of those who sell their canes to the usines and those who manufacture at home, it is remarked that in the one case the canes are no sooner out of the fields than the gangs and stock are at work preparing the land for the next crop, and all the fields are tidy and clean. In the other case, fields are left to take care of themselves until the crop season is over. Estates which, before the establishment of the usines, were in debt, are now said to be in a flourishing condition, and others which had almost fallen out of cultivation are now making excellent crops.

“In most of the factories hydraulic or other presses are employed for extracting the remnants of juice from the skimmings. The former are carefully returned to the clarifiers, the residuum being a hard cake, which is used for fodder and manure.”



